## **CLAIMS**

## We claim:

- 1. A lyophilization medium for a microorganism wherein the medium is substantiallty free of animal-derived products and comprises yeast extract and monosodium glutamate.
- 2. The lyophilization medium of claim 1, comprsing about 1-10% (w/v) monosodium glutamate and about 1-10% (w/v) yeast extract.
- 3. The lyophilization medium of claim 2, comprising about 5 % (w/v) monosodium glutamate and about 10% (w/v) yeast extract.
- 4. The lyophilization medium of claim 1 or 2 or 3 wherein the microorganism is a strain of bacteria.
- 5. The lyophilization medium of claim 4 wherein the strain of bacteria is Corynebacterium diphtheriae
- 6. A method for preparing a freeze-dried culture of a microorganism comprising the steps of: providing a quantity of the microorganism; mixing said quanity with a lyophilization medium wherein the medium is substantiallty free of animal-derived products and comprises yeast extract and monosodium glutamate to provide a mixture; and freeze-drying said mixture.
- 7. The method of claim 4, wherein the lyophilization medium of comprses about 5 % (w/v) monosodium glutamate and about 10% (w/v) yeast extract.

- 8. The method of claim 5, wherein the lyophilization medium of comprses about 1-10% (w/v) monosodium glutamate and about 1-10% (w/v) yeast extract.
- 9. The method of claim 6 or 7 or 8 wherein freeze-drying of said mixture comprises steps of:
  - (a) achieving a first temperature of about -30 °C for said mixture to provide a cooled mixture;
  - (b) maintaining said cooled mixture in a vacuum for a time until said cooled mixture is substantially dry to provide a dried mixture.
- 10. The method of claim 7 wherein the vacuum is about 120 mT.
- 11. The method of claim 8 wherein the time is between about 10 and about 12 hours.
- 12. The method of claim 7 wherein the step of maintaining said cooled mixture in a vacuum for a time until said cooled mixture is substantially dry to provide a dried mixture comprises:
  - (a) maintaining said cooled mixture in a vacuum for a time of between about 10 and about 12 hours; and
  - (b) increasing said temperature of about -30 °C to a second temperature of about +20 °C.
- 13. The method of claim 10 wherein the vacuum is about 120 mT.
- 14. The method of claim 6 or 7 or 8 wherein the microorganism is a strain of bacteria.
- 15. The method of claim 14 wherein the strain of bacteria is a strain of Corynebacterium diphtheriae

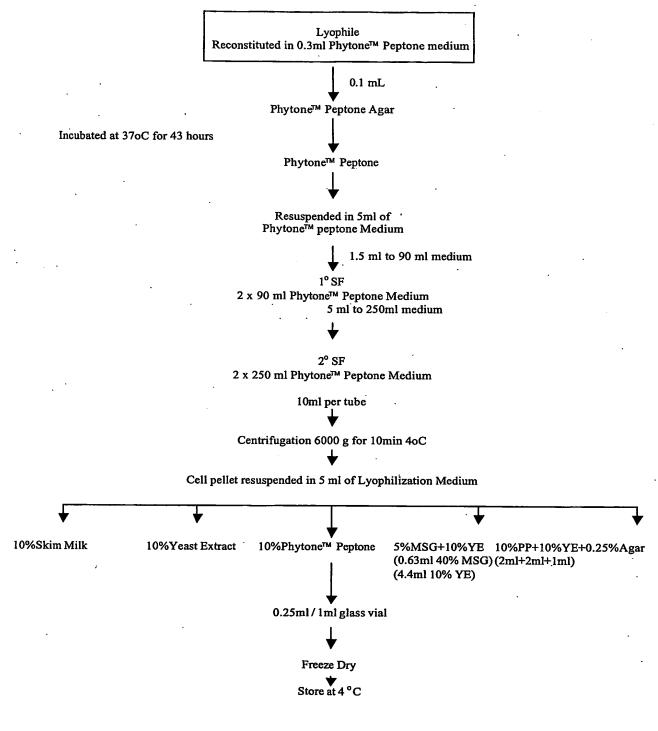
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16. A free-dried lyophile comprising cells of a microorganism and a lyophilization medium wherein the medium is substantially free of animal-derived products and comprises yeast extract and monosodium glutamate.

- 17. The freeze-dried lyophile of claim 12, wherein the medium comprises about 1-10% (w/v) monosodium glutamate and about 1-10% (w/v) yeast extract.
- 18. The freeze-dried lyophile of claim 13, wherein the medium comprises about 5 % (w/v) monosodium glutamate and about 10% (w/v) yeast extract.
- 19. The freeze-dried lyophile of claim 16 or 17 or 18 wherein the microorganism is a strain of bacteria.
- 20. The freeze-dried lyophile of claim 19 wherein the strain of bacteria is a strain of Corynebacterium diphtheriae.

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Figure 1: A flow diagram outlining the preparation and lyophilization of a C. diphtheriae culture.



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